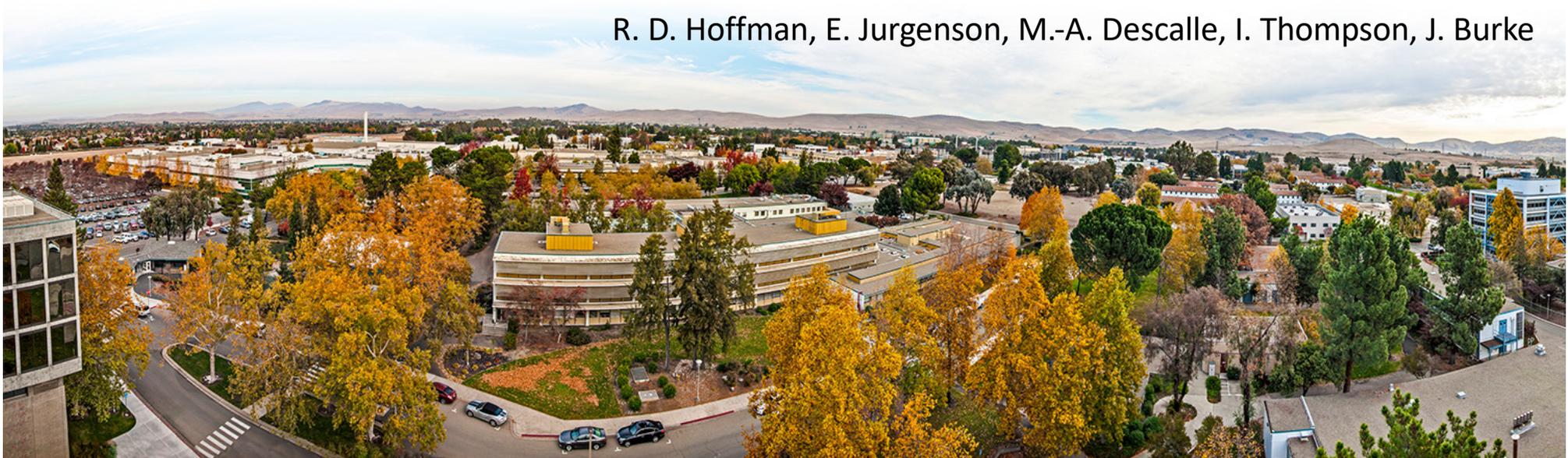


LLNL Neptunium Evaluation Guided by Surrogate (n,f) Measurements

Nuclear Data Week 2020 - CSEWG

December 1, 2020

R. D. Hoffman, E. Jurgenson, M.-A. Descalle, I. Thompson, J. Burke



LLNL-PRES-789384

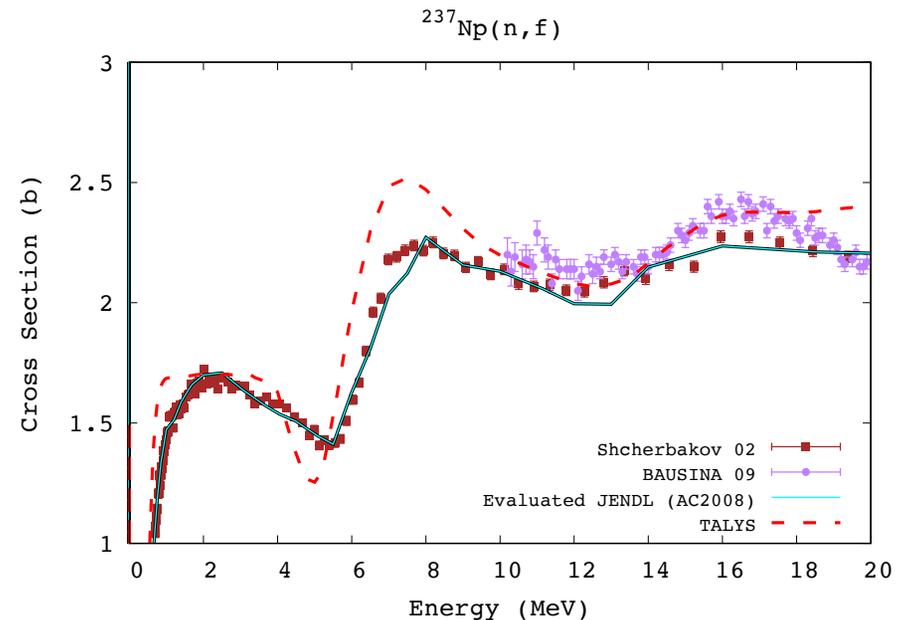
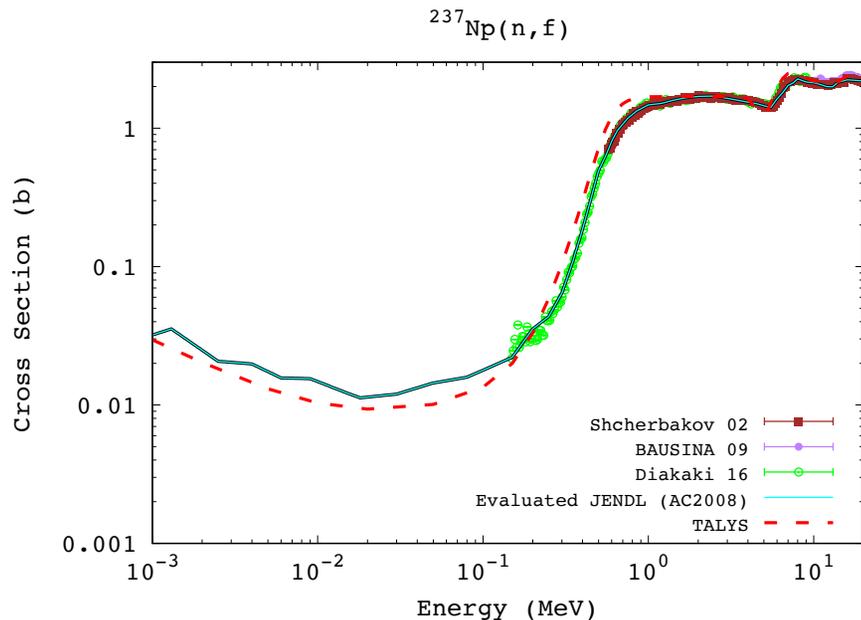
This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under contract DE-AC52-07NA27344. Lawrence Livermore National Security, LLC

New LLNL Neptunium Evaluation

- ❑ Surrogate CS measurements: Np237(n,f) & Np239(n,f) – Burke et al.
- ❑ Current LLNL Evaluation based on JENDL/AC-2008 (CCONE)
- ❑ New Evaluation: Used TALYS-1.8 – Hoffman
- ❑ ENDF output processed to ENDL & GNDS – Jurgenson & Thompson
- ❑ Verification(Broomstick) & Validation(6 ICSBEP) – Descalle
- ❑ For evaluation, processing, V&V details see: [LLNL-TR-784548 \(2019\)](#)

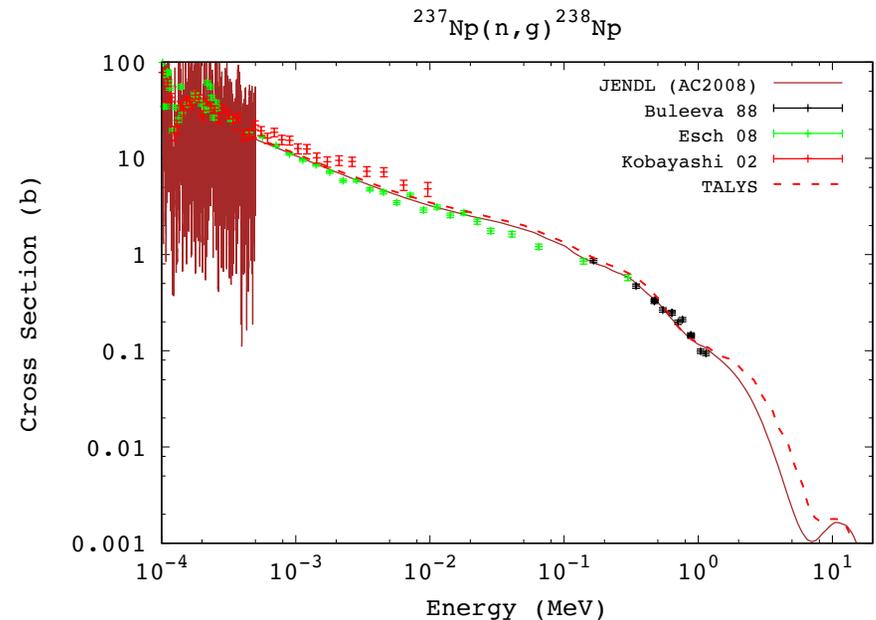
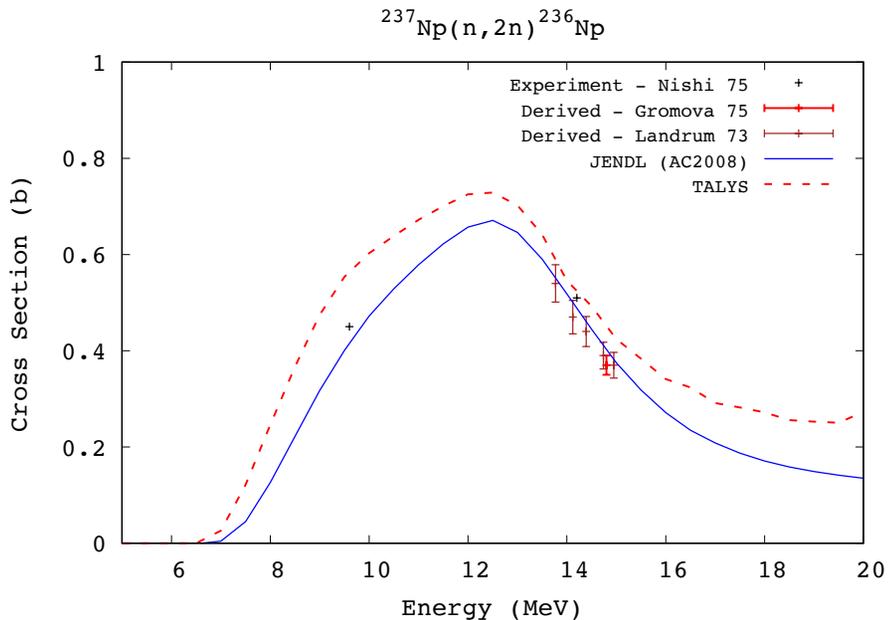


$^{237}\text{Np}(n,f)$ TALYS evaluation



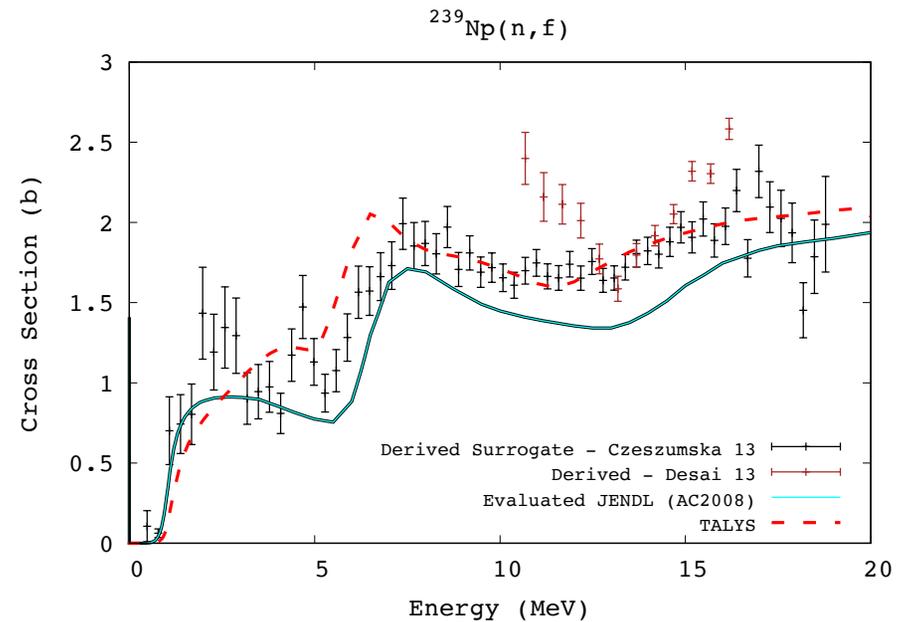
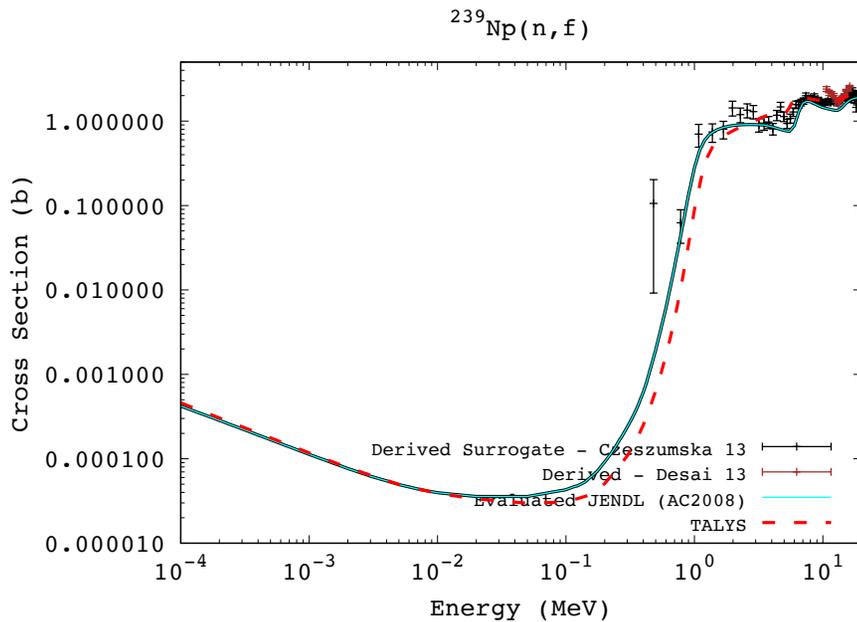
- ENDL2009.3 fit to TOF data of Shcherbakov(2002) & Diakaki(2016)
- 1st priority was agreement with BAUSINA 2009: (10-16 MeV)
- 2nd priority was agreement with first chance fission peak
- 3rd priority was not blowing up low energy cross section

^{237}Np (n,2n) & (n,g) TALYS evaluation



- (n,f) fitting still jibes with other experimental data:
(n,2n) at 14 MeV, (n,g) at 30 keV – acceptable

$^{239}\text{Np}(n,f)$ TALYS evaluation



- 1st priority was agreement with Czeszumka 2013: (10-16 MeV)
- 2nd priority was agreement with second chance fission peak (8 MeV)
- 3rd priority was not blowing up low energy cross section
- Surrogate CS evaluations: Pu(Quaglioni 2017), Am(Ormand 2018), & Th(Hoffman 2020)

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